

## Effects and Management of Onchocerciasis among Parents in the Lower Benue Trough of Nigeria

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### ABSTRACT:

In this study a descriptive survey research design involving the collection of *onchocerciasis* response data from Parents, Council Health Staff, State *Onchocerciasis* Health Unit, Community Directed Distributors, Community Stakeholders on *Onchocerciasis* treatment in the Council Area and the health centres were adopted. Specifically, the survey seeks to evaluate the factors that are possibly associated with compliance with mass treatment with ivermectin and the awareness of risk factors of *onchocerciasis* in Idemili North Council Area of Anambra State, Some parts of the population would be studied and finding from these parts is expected to generalised to the entire population. The questionnaire was the instrument for data collection. The data collected and the result obtained were analysed. The major findings of this study are that the state agency is operational ready to meet the exigencies of *onchocerciasis* operation in the local government level. Moreover, there are no logistics in place at the community level that could be used during the distribution of the drug to the villagers.

Therefore, the community is not in any way prepared to deal effectively with *onchocerciasis* and its inherit problems. The various agencies responsible for *onchocerciasis* control and mectizan distributions are not properly co-ordinated at the village level. These have a negative impact on the donor agencies. Thus the community should be overhaul and necessary facilities put in place to ensure proper distribution of mectizan by the community directed distributors for prompt response to *onchocerciasis* events.

**Keywords:** *Onchocerciasis*, ivermectin, mectizan, exigencies, Community Directed Distributors

### 1. INTRODUCTION

*Onchocerciasis* is an eye and skin disease. The symptoms are primarily caused by *microfilariae*-the immature larval forms of the *onchocerciasis* volvulus worm that move around the human body in the subcutaneous tissue. *Microfilariae* live for 1-2 years and induce intense inflammatory responses, especially when they die. According to Kale (1998) *Onchocerciasis* or River blindness is a parasitic disease with an insect vector that breeds in water. It is the world's second leading infectious cause of blindness. Controlling insect breeding sites in rivers is one of the pillars of prevention and management.

The offspring of the worms, called *microfilariae*, swarm under the skin where they can infect black flies when they bite. The *microfilariae* irritate the skin and cause intense itching, skin discoloration, and rashes. If the *microfilariae* enter the eyes, they cause inflammation and irritation, which can cause diminished vision and potential blindness. The disruption of family life and education resulting from the disease directly affects local economies and long-term development.

The disease does not appear to cause premature or direct death, but is often acutely and chronically disabling. *Diethylcarbamazine* and *suramin* are effective in preventing disabling complications and in diminishing or controlling the progression of complications, but are nephrotoxic. Surgery is utilized to excise *microfilaria*-producing nodules in order to minimize or control disease progression and for the repair of the frequently occurring complication of inguinal or femoral hernias and hydroceles. Generally, live *microfilariae* stimulate very little inflammatory response. They appear to pass undetected by the host's immune system despite the presence of a demonstrable host antibody and cell-mediated immune response (Gallin, M, et al 1999). According to Ottesen, E. A. (1995) Inflammation is associated with dead or dying *microfilariae* and is probably initiated by the release of, or exposure to, microfilarial antigens. The mechanisms that protect live *microfilariae* are unclear. More heavily infected persons show evidence of immunosuppression, which can be reversed with treatment. It is not the nematode, but its endosymbiont, *Wolbachia pipientis* that causes the severe inflammatory response that leaves many blind. (Willey, J. M. et al 2009). A high percentage of patients had *microfilarial* eye infiltrates but blindness was uncommon. The disease should therefore be known as 'river eye disease' rather than the current 'river blindness'.

*Ivermectin* is a *microfilaricidal* drug and in the absence of *macrofilaricides*, it should be administered over many years (13-20 years) in order to eliminate *onchocerciasis* as a public health problem. Therefore, long-term compliance to *ivermectin* treatment by all eligible communities in both meso-endemic and hyper-endemic areas is crucial in achieving sustainable disease control. Brieger (2002) opined, that intermediate strategy between control and eradication, especially when there are insufficient resources for universal coverage, would be the total elimination of the vector in limited high-risk areas, with a progressive expansion of these areas as funds permit, and with surveillance against reinfestation.

## 2. MATERIALS AND METHODS

**2.1 Study Area:** The study area is Idemili North Local Government Area in the central senatorial district of Anambra state. Idemili North Local Government Area was created in 1996. It was carved out of the former Idemili Local Government Area with its headquarters at Ogidi. Idemili North Local Government Area shares boundaries with Omagba Onitsha North Local Government Council, Nkwelle-Ezunaka, Ogbunike Oyi Local Government Council, Umudioka, Umunachi Dunukofia Local Government Council, Abagana, Nimo Njikoka Local Government Council, Neni, Adazi-ani Anocha Local Government Council, Alor, Nnobi, Oba Idemili South Local Government Council and Okpoko Ogbaru Local Government Council.

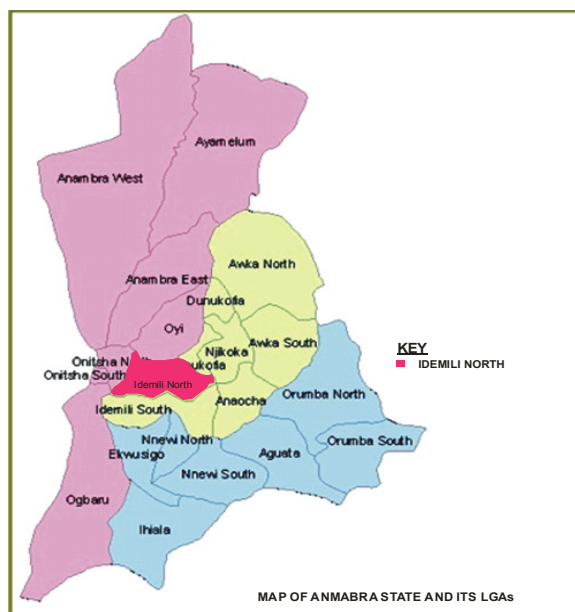
It has a land area of approximately 23.756sq kilometers with projected population of 321,611 people. It is one of the largest local government areas and is made up of ten autonomous communities with 13 wards. The autonomous communities are Abacha, Abatete, Ezi-owelle, Ideai, Nkpor, Obosi, Ogidi, Oraukwu, Uke and Umuoji. Idemili North Local Government Area has about 51 primary schools, 10 secondary schools, and 16 recognized private commercial/vocational schools. Idemili North Local Government Area houses the Anambra state high court Ogidi and Anambra state building material market Ogidi.

The people of Idemili North L. G. A. are blessed with enviable cultural heritage which has been compromised by the increasing influence of modernity and urbanization, They are proud of their culture. They are also annual festivals like Emen nwafor festival Ogidi that is celebrated after every planting season, Ito ogbo Obosi, Orumuo na nnunumuo Umuoji etc.

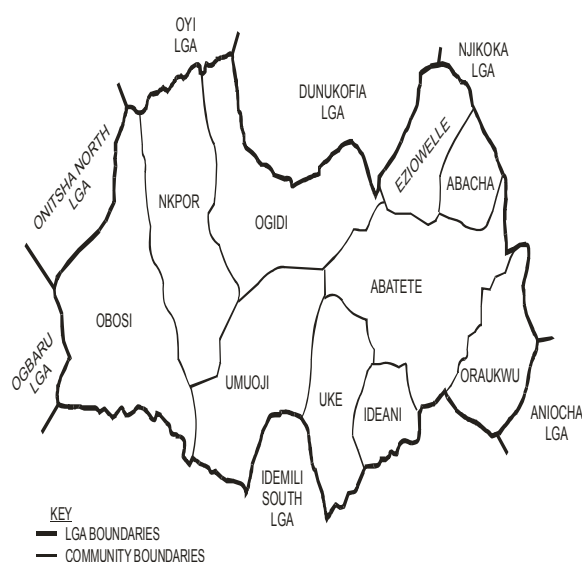
Idemili North L. G. A. is blessed with rich soil, which supports Agriculture. The populace is predominantly Yam and cassava farmers and therefore produces a lot of cassava fufu along with other food crops such as cocoyam, maize, plantain, banana, orange paw-paw coco-nut, mango, bitter-leaf, goat and poultry are also reared in subsistence and commercial quantities like Emeka Okuku farm, Idemili farm, etc at Ogidi. There are many co-operative activities handling commercial and agricultural concern including fish farming.



Map of Nigeria Showing the Position of Anambra State



MAP OF IDEMILI NORTH LOCAL GOVERNMENT



MAP OF IDEMILI NORTH THE STUDY AREA

## 2.2 Field Sample Selection

The sample for the study consisted of 583 male and female parents from ten communities in Idemili North L.G.A. Ten percent of the accessible population were used as sample size. Multi-stage sampling procedure was used for the study. In stage one, all the parents in Idemili North LGA were clustered into ten representing the ten communities in Idemili North Council Area. In stage two, all the towns were listed out. Seven were randomly drawn using simple random sampling technique by balloting with replacement. In stage three, male and female parents were chosen from each of the seven towns. Non-probability (chance selection) was used in selecting the parents. At the end, 583 parents were selected and used for the study. The instrument used for data collection was structured interview Protocol. The researcher following review of related literature and personal experiences developed the instrument. Structured interview was used because some of the respondents are illiterates.

## 2.3 Data Collection

The interview protocol was in four sections. Section “A” contained three questions on background information of the respondents. Section “B” contained ten questions on modes of transmission of *onchocerciasis*. Section “C” contained ten questions on Use of *Ivermectin* in the management of *Onchocerciasis*. Section “D”

contained ten questions on Use of Medication in the management of *Onchocerciasis*. Section “E” contained ten questions on Use of Vector control in the management of *Onchocerciasis*. All questions are close-ended (Appendix A).

Five hundred and eight three copies of the structured interview protocol were distributed to male and female parents in the ten communities in Idemili North Local Government Area by the researcher and trained research assistants and community town crier who worked in pairs. Distribution and collection of the instrument lasted for three weeks.

## 2.4 Statistical Analysis

Data collected were analysed using descriptive statistics of frequency, percentage and grand mean as well as inferential statistics of chi-square. Percentages were used to answer the research questions while the null hypotheses were tested using  $\chi^2$  (chi-square) at 0.05 level of significance. Appropriate degrees of freedom were used.

## 3. RESULTS

### 3.1 Distribution of respondent's gender

Distribution of the respondent's gender shows that 281 (48.2%) were males while 302 (51.8%) were females, table 1.

Table 1 shows the Distribution of respondent's gender

S/N	Gender	Frequency	%
(a)	Male	281	48.2
(b)	Female	302	51.8
	<b>Total</b>	<b>583</b>	<b>100%</b>

% = percentage

### 3.2 Respondents' level of education

From the table 2, 112 (19.2%) had non-formal education, 131 (22.5%) had primary education, 140 (24.0%) had secondary education while 200 (34.3%) had tertiary education.

Table 2 shows the respondent's level of education.

S/N	Level of education	F	%
a.	Non-formal	112	19.2
b.	Primary education	131	22.5
c.	Secondary education	140	24.0
d.	Tertiary education	200	34.3
	<b>Total</b>	<b>583</b>	<b>100%</b>

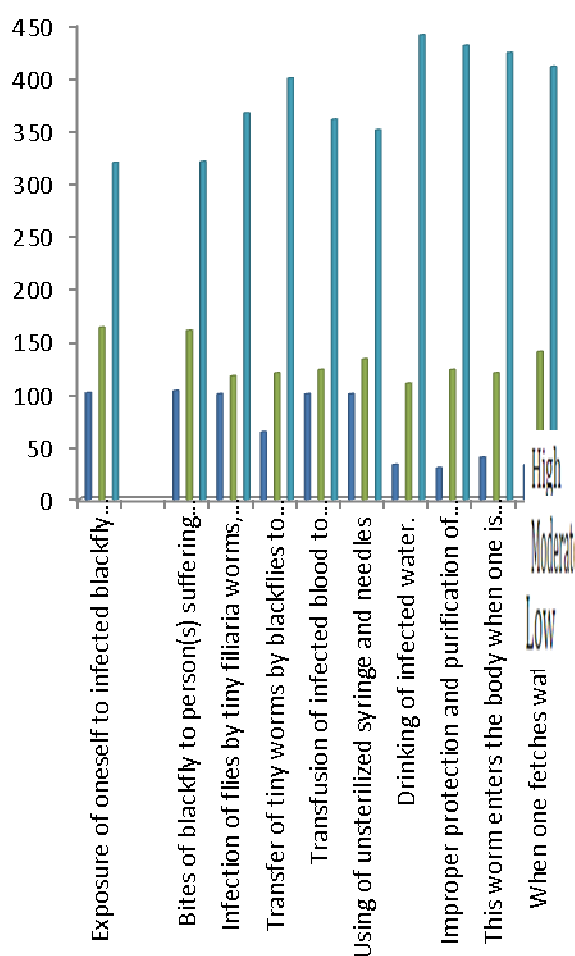
% = percentage

### 3.3 Level of awareness of mode of transmission of *onchocerciasis*

Table 3 reveals the respondents' level awareness of modes of transmission of onchocerciasis. It shows that 101 (17%) possessed high level of awareness that exposure of oneself to infected blackfly can predispose one to onchocerciasis, 163 (28%) possessed moderate level of awareness while 319 (55%) possessed low level of awareness; 103 (18%) possessed high level awareness that bites of blackfly to person(s) suffering from river blindness, 160 (27%) possessed moderate level of awareness while 320 (55%) possessed low level of awareness; 100 (17%) possessed high level of awareness that Infection of flies by tiny filaria worms, when sucking the blood of infected person, 117 (20%) possessed moderate level of awareness, while 366 (63%) had low level of awareness; 64 (11%) possessed high level of awareness that transfer of tiny worms by blackflies to uninfected persons, 123 (21%) possessed moderate level of awareness, while 360 (62%) possessed low level of awareness; 100 (17%) possessed high level of awareness that using of unsterilized syringe and needles, 133 (23%) possessed moderate level of awareness while 350 (60%) possessed low level of awareness; 33 (6%) possessed high level of awareness that drinking of infected water, 110 (19%) possessed moderate level of

awareness, while 440 (75%) had low level of awareness; 30 (5%) possessed high level of awareness that improper protection and purification of public water supply, 123 (21%) possessed moderate level of awareness while 430 (74%) possessed low level of awareness; 40 (7%) possessed high level of awareness that this worm enters the body when one is bitten by blackfly, 120 (21%) possessed moderate level of awareness, while 423 (72%) possessed low level of awareness; 33 (6%) possessed high level of awareness that when one fetches water in the river infected with blackfly, 140 (24%) possessed moderate level of awareness and 410 (71%) possessed low level of awareness.

**Figure 3: Level of awareness of mode of transmission of *onchocerciasis***

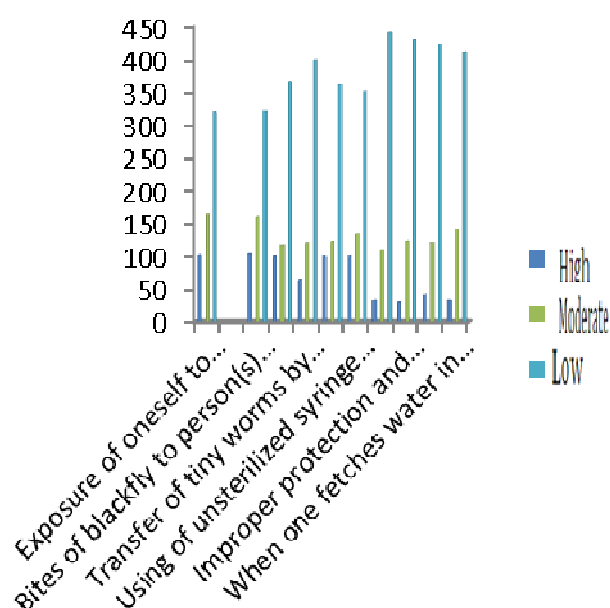


### 3.4 Level of awareness of medication as a mode of managing *onchocerciasis*

Table 4 reveals the frequency distribution of respondents' level awareness of use of medication in the management of onchocerciasis. It shows that 50 (9%) possessed high level of awareness that Ivermectin prevents Onchocerciasis, 120 (21%) possessed moderate level of awareness while 413 (71%) possessed low level of awareness; 52 (9%) possessed high level awareness that another name for Ivermectin is Mectizan, 121 (21%) possessed moderate level of awareness while 400 (68%) possessed low level of awareness; 102 (17%) possessed high level of awareness that Ivermectin is taken once a year, 117 (20%) possessed moderate level of awareness, while 364 (62%) had low level of awareness; 150 (26%) possessed high level of awareness that Ivermectin is taken according to ones height, 200 (34%) possessed moderate level of awareness, while 264 (40%) possessed low level of awareness; 141 (24%) possessed high level of awareness that Ivermectin is free of any charge, 109 (19%) possessed moderate level of awareness while 333 (57%) possessed low level of awareness; 200 (34%) possessed high level of awareness that Ivermectin is distributed by Community directed distributors, 133 (23%)

possessed moderate level of awareness, while 250 (43%) had low level of awareness; 140 (24%) possessed high level of awareness that Ivermectin have no side effect, 210 (36%) possessed moderate level of awareness while 233 (40%) possessed low level of awareness; 150 (26%) possessed high level of awareness that Ivermectin also expels worms, 123 (21%) possessed moderate level of awareness, while 310 (53%) possessed low level of awareness; 163 (28%) possessed high level of awareness that the Community directed distributors distribute the drug at designated places, 120 (21%) possessed moderate level of awareness, 300 (51%) possessed low level of awareness; 143 (25%) possessed high level of awareness that children less than 90 metres do not drink Ivermectin, 140 (24%) possessed moderate level of awareness and 300 (51%) possessed low level of awareness.

**Table 4 Level of awareness of medication as a mode of managing *onchocerciasis***



### 3.5 The level of awareness of modes of transmission of *Onchocerciasis* based on their gender

Table 6 reveals respondents' level of awareness of modes of transmission of *Onchocerciasis* based on their gender. It shows that 43(7.4%) male possessed high level of awareness, 65(11.1%) possessed moderate level of awareness while 145 (24.9%) possessed low level of awareness based on their gender and the total number of male is 254(43.4%); 75(12.9%) possessed high level awareness based on their gender, 80(13.7%) possessed moderate level of awareness while 175 (40%) possessed low level of awareness and the total number of female is 330(56.6%).

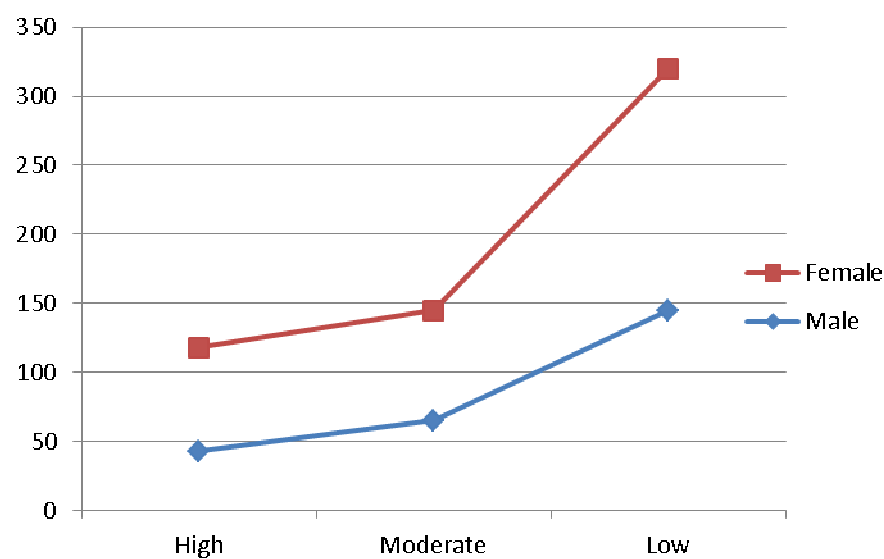
**Table 6 Level of awareness of modes of transmission of *Onchocerciasis* based on their gender**

S/N	Gender	High	Moderate	Low	Total
1	Male	43(7.4%)	65(11.1%)	145(24.9%)	254(43.4%)
2	Female	75(12.9%)	80(13.7%)	175(40%)	330(56.6%)
	<b>Total</b>	<b>118(20.3%)</b>	<b>145(24.8%)</b>	<b>320(64.9%)</b>	<b>583(100%)</b>

S/N	Gender	High	Moderate	Low	Total
1	Male	35(6.0%)	50(8.6%)	145(24.9%)	230(39.5%)
2	Female	73(12.5%)	85(14.6%)	195(33.4%)	355(60.5%)
	<b>Total</b>	<b>108(18.5%)</b>	<b>135(23.2%)</b>	<b>340(58.3%)</b>	<b>583(100%)</b>

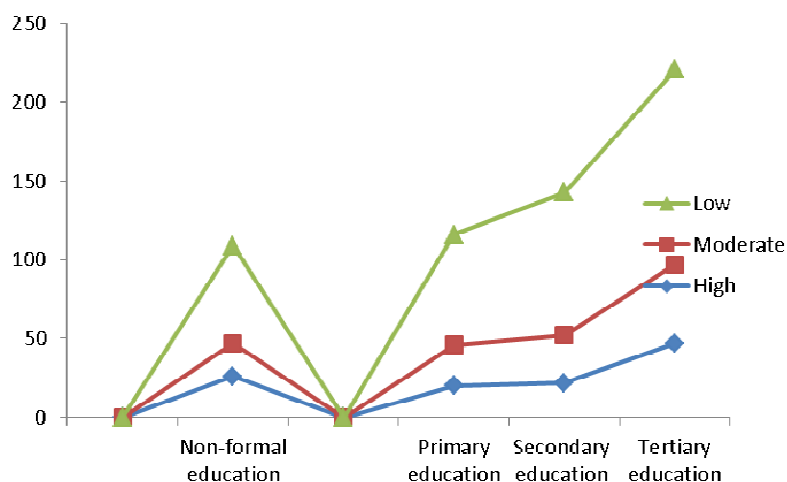
S/N	The level of education	High	Moderate	Low	Total
1	Non-formal education	26(4.5%)	21(3.6%)	62 (10.6%)	103 (17.6%)
2	Primary education	20(3.4%)	26(4.5%)	70 (12%)	116(19.9%)
3	Secondary education	22(3.8%)	30 (5.1%)	91 (15.6%)	143(24.5%)
4	Tertiary education	47(8.1%)	50 (8.6%)	124 (21.3%)	221(37.9%)
	Total	115(19.7%)	127(21.8%)	341(58.5%)	583(100%)



**Table 7 level of awareness of management of *Onchocerciasis* base on the level of Education**

S/N	The level of education	High	Moderate	Low	Total
1	Non-formal education	45(7.7%)	50(8.6%)	134 (23%)	229 (39.3%)
2	Primary education	40(6.9%)	45(7.7%)	70 (12%)	155(26.6%)
3	Secondary education & above	31(5.3%)	33 (5.7%)	90 (15.4%)	154(26.4%)
4	Total	116(19.9%)	128 (22%)	339 (50.4%)	583(100%)





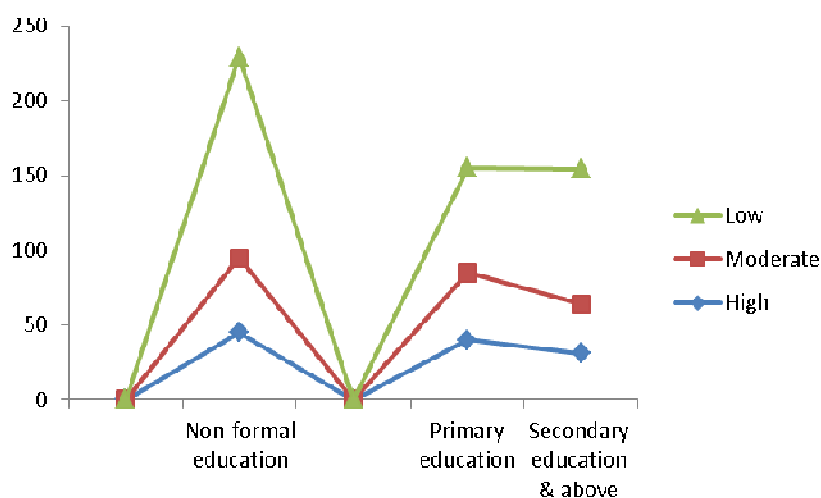
### 3.6 level of awareness of management of *Onchocerciasis* base on the level of Education

Table 7 reveals the frequency distribution of respondents' level of education. It shows that 26(4.5%) possessed high level of education, 21(3.6%) possessed moderate level of awareness while 62 (10.6%) possessed low level of awareness of non-formal education; 20(3.4%) possessed high level awareness of primary education, 26(4.5%) possessed moderate level of awareness while 70 (12%) possessed low level of awareness; 22(3.8%) of Secondary education possessed high level of awareness, 30 (5.1%) possessed moderate level of awareness, while 91 (15.6%) had low level of awareness; 47(8.1%) of tertiary education possessed high level of awareness, 50 (8.6%) possessed moderate level of awareness, while 124 (21.3%) possessed low level of awareness.

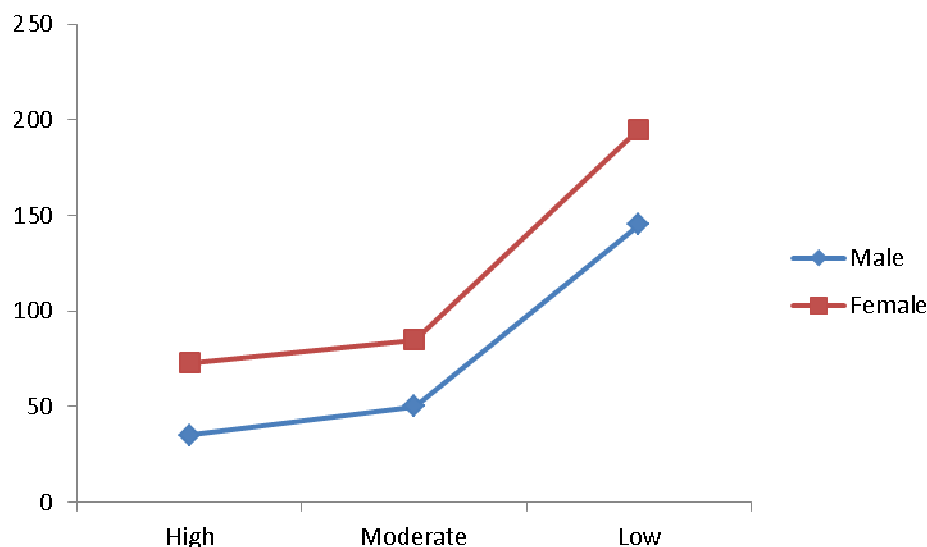
### 3.7 Level of awareness of management of *Onchocerciasis* base on their gender and there is no significant relationship between male and female parents in Idemili North L.G.A. in their level of awareness of management of *Onchocerciasis* by gender.

It shows that 35(6.0%) male possessed high level of awareness, 50(8.6%) possessed moderate level of awareness while 145(24.9%) possessed low level of awareness based on their gender and the total number of male is 230(39.5%); 73(12.5%) possessed high level awareness based on their gender, 85(14.6%) possessed moderate level of awareness while 195(33.4%) possessed low level of awareness and the total number of female is 355(60.5%).

Table 8 Respondent's level of awareness of management based on their gender







$\chi^2 = 5.22$ ,  $\chi^2$  at 0.05 = 7.83 df=3,  $p < 0.05$  see Appendix C for the test of hypothesis since  $\chi^2$  calculated of 5.22 <  $\chi^2$  table, the null hypothesis (H<sub>0</sub>) is accepted and so it is calculated that there is no significant relationship among parents gender in Idemili North Local Government Area in their level of awareness of management of *Onchocerciasis*.

**3.8 Level of awareness of the modes of transmission of *Onchocerciasis* by their level of Education** and there is no significant awareness of the modes of transmission of *onchocerciasis* among parents in Idemili North Local Government Area based on their level of Education.

**Table 9 Level of awareness of the modes of transmission of *Onchocerciasis* by their level of Education**

$\chi^2 = 1.96$ ,  $\chi^2$  at 0.05 = 12.59 df=6,  $p < 0.05$  see Appendix D for the test of hypothesis vii since  $\chi^2$  calculated of 1.96 <  $\chi^2$  table of 12.59, the null hypothesis (H<sub>0</sub>) is accepted and so it is calculated that there is no significant relationship among parents in Idemili North Local Government Area on their level of Education.

## Discussion

There is limited data on the prevalence of onchocerciasis in the level of awareness of management of *Onchocerciasis* among parents in Idemili North Local Government Area, partly because treatment with the effective drug Ivermectin has been contra-indicated in children less than 5. As the risk of complications of onchocerciasis is related to duration and intensity of infection, it would be beneficial to know the prevalence among parents in Idemili North Local Government Area for design of control programmes.

This study was therefore undertaken to determine the level of awareness of management of *Onchocerciasis* among parents in Idemili North Local Government Area in 583 parents in a rain forest endemic community in South East Nigeria. The overall level of awareness of management of *Onchocerciasis* for 583 parents in Idemili North Local Government Area in Anambra State, Eastern Nigeria with no significant relationship between male and female parents in Idemili North L.G.A. in their level of awareness of management of *Onchocerciasis* by their level of education.

There was no significant awareness of the modes of transmission of *onchocerciasis* among male and female parents in Idemili North Local Government Area based on their gender. Characteristic low level of awareness was identified in the level of awareness of mode of transmission of *onchocerciasis* among parents in Idemili North Local Government Area; Use of Medication in the management of *Onchocerciasis*; and Use of vector control in the management of *Onchocerciasis*.

This indicates that in onchocerciasis endemic communities, everybody may be at risk of infection. More so, in this study, the outcomes of illiteracy are expressed as consequences for various low awareness of modes of transmission and management of *Onchocerciasis* among parents in Idemili North Local Government Area.

This concept is the dependent variables in most of the studies and has been combined into three dimensions of a parent's life: **societal and economic**, **family and household**, and the **individual**. Together these dimensions reflect the quality of a community's life. As noted in the tables above, quality of life is an elusive concept, which combines objective elements with subjective perceptions and interpretations of personal experience. As such, it is observable only through an individual's self-reporting and is influenced by the social and cultural context of norms, values and expectations that give meaning to everyday life.

It is difficult to fit the complexity and richness of a community's life into a classificatory scheme. However, although cultural and individual differences challenge generalization, the project has attempted to construct a framework that reflects aspects of parents' attitude and character most likely to be affected by onchocerciasis and encourage poor level of awareness of modes transmission and management of onchocerciasis in Idemili North Local Government Area.

## Conclusion

Based on the findings, the following conclusions were drawn.

1. Majority of the respondents strongly disagreed to the Modes of Transmission of Onchocerciasis, Use of Medication in the management of Onchocerciasis, Use of Ivermectin in the management of Onchocerciasis and Use of Vector control in the management of Onchocerciasis as a way of awareness of modes of transmission and management of onchocerciasis, showing high level of awareness.
2. There were no significant relationship among parents in Idemili North Council in their level of awareness of modes of transmission and management of onchocerciasis based on their gender and level of education.
3. Respondents that are female, possessed the highest level of awareness of modes of transmission and management of onchocerciasis.
4. Respondents that are male, possessed the lowest level of awareness of modes of transmission and management of onchocerciasis.
5. Respondents with non-formal education possessed the lowest level of awareness of modes of transmission and management of onchocerciasis.
6. Respondents with tertiary education possessed the highest level of awareness of modes of transmission and management of onchocerciasis.

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